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09/637,047	08/11/2000	Fan Zhou	FORE-74	7203
7590 12/07/2004			EXAMINER	
Ansel M. Schwartz One Sterling Plaza Suite 304 201 N. Craig Street Pittsburgh, PA 15213			MOORE, IAN N	
			ART UNIT	PAPER NUMBER
			2661	
DATE MAILED: 12/07/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/637,047

Applicant(s)

ZHOU ET AL.

Examiner

Ian N Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on the amendment filed on 08 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-14 and 16-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. This is in response to amendment filed on 8-6-2004.
2. Claims 1,3-14, and 16-24 are rejected in rejected by the new ground of rejections.

### *Claim Objections*

3. Claim 1 objected to because of the following informalities: Claim 1 recites, "...segments are **received followed** by a signal final..." in line 7. For clarity, it is suggested to insert a comma ",", between "received" and followed (i.e. received, followed). Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9-13 and 18-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 9** recites, "a packet" in line 7. It is unclear whether "a packet" is the same "a packet" as recited in claim 1 line 4.

**Claim 18** recites the limitation "**the** memory controller" in line 2. There is insufficient antecedent basis for this limitation in the claim.

**Claims 10-13 and 19-24** are also rejected since they are depended upon above rejected claims.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1,3,4,14,16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Sindhu (U.S. 5,905,725).

**Regarding Claim 1**, Sindhu discloses a switch for switching packets (see FIG. 2B, Router 20) from a plurality of sources (see FIG. 2B and 3, Input ports 107; see col. 4, lines 16-20, 24-25,28-30) comprising:

a memory (see FIG. 2B and 5B, Memory 104) in which portion of the packets (see col. 4, lines 53-60; fixed length cells 454,456) are stored (see col. 4, lines 31-34); and

a transferring mechanism (see FIG. 2B and 5B, Input Switch 100) which transfers a predetermined portions of a packet (see FIG. 5B, fixed length cell 454, 456; see col. 4, lines 53-60) to the to the memory as the predetermined portions are received (see FIG. 5B, fixed size cell 450, 452) transferring predetermined portions of the packet as fixed length segments as the fixed length segments are received (see FIG. 3, Data handler 304 of Input port 107 segments the packet into fixed sized cell, thus input switch 100 received fixed length cell; see col. 4, lines 52-64) followed by a single final segment of any length (see col. 7, lines 53-54; arbitrary length) less than or equal to the length of the fixed length segments (see col. 7, lines

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50-55; note that the last cell is arbitrary length of less than or equal to the fixed sized cell length since the packet is divided into fixed length) wherein the packet is transferred to the memory (see FIG. 5B, series of cells 454,456 toward memory 104) to smooth out bursts caused by lengthy packets (see col. 2, lines 14-35).

**Regarding Claim 14**, the method claim, which has substantially all the limitations of the respective switch claim 1. Therefore, it is subjected to the same rejection.

**Regarding claims 3 and 16**, Sindhu discloses the transferring mechanism transfers fixed length segment of different packets (see FIG. 5B, different fixed sized cells, 454,456) interleaved among each other as they are received to the memory (see FIG. 5A, Round robin data handler 500 and output processor 505; note that the cells from each incoming port are multiplexed, by utilizing time division multiplexing scheme, and then sending them to the memory. Thus, the “interleaving” process is the “time division multiplexing” process; see col. 6, lines 1-14).

**Regarding claim 4**, Sindhu discloses the transferring mechanism (see FIG. 5B, Input Switch 100) includes an aggregator (see FIG. 5B, Round Robin Data Handler 500; see col. 6, lines 1-14) which receives portions of packets (see FIG. 5B, fixed length cells 450,452) from the plurality of sources (see FIG. 5B, B0-B7; sources stations which connect to Input ports 107; see col. 4, lines 16-20, 24-25,28-30).

**Regarding claim 17**, Sindhu discloses receiving portions of packets (see FIG. 5B, fixed length cells 450,452) from the different sources (see FIG. 5B, B0-B7; sources stations which connect to Input ports 107; see col. 4, lines 16-20, 24-25,28-30) at an aggregator (see FIG. 5B, Round Robin Data Handler 500; see col. 6, lines 1-14) of the transferring

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mechanism disposed in a fabric of the switch (see FIG. 2B, a combined system of input switch 100, memory 104, controller 106, and output switch 102 are a fabric of the router 100; see col. 4, lines 20-30).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhu.

**Regarding claim 5**, Sindhu discloses a memory (see FIG. 2B, Memory 104) and memory controller (see FIG. 2B, controller 106) for storing and controlling processes. Sindhu does not explicitly disclose a memory includes a memory controller. Incorporating a memory controller within a memory does not define a patentable distinct invention over that in the system of Sindhu since the invention as a whole and the system of Sindhu are directed to storing data/cells in the memory. The degree in which a memory includes a memory controller presents no new or unexpected results, so long as the data/cells are stored in the memory, and the data/cells is processed in a successful way. Therefore, to have a memory includes a memory controller to store data/cell would have been routine experimentation and optimization in the absence of criticality.

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**Regarding claims 6 and 18**, Sindhu discloses wherein the aggregator uses TDM to multiplex segments of packets from different sources to the memory controller (see col. 2, lines 30-42; see col. 6, lines 1-14).

**Regarding claims 7 and 19**, Sindhu discloses placing an identifier (see FIG. 6, a data structure of Key 602, full address 604, and offset 606) with each segment identifying from which source (see FIG. 2A, a packet from Input port 107) the segments came from (see col. 6, lines 26-40; see col. 4, lines 36-39).

**Regarding claims 8 and 20**, Sindhu discloses wherein memory controller includes per source queues (see FIG. 11A, Memory banks 105), and stores each segment in a corresponding per source queue based on the identifier of the source (see col. 6, lines 32-65; see col. 9, lines 18-44).

10. Claims 9-13 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhu in view of Calamvokis (U.S. 5,557,610), and further in view of Petersen (U.S. 5,822,321).

**Regarding Claims 9 and 21**, Sindhu discloses all of the limitations as recited in claims 1-8 and 14-20 above. Sindhu does not explicitly disclose per destination queues, and the packet is changed from a source queue to a corresponding per destination queue. However, Calamvokis teaches per destination queues (see Fig. 8, Output Shift Register, S.R.OUT 64 and Fig. 9, plurality of S.R.OUT for line outputs N; note that each output shift register in the shared memory is a “destination queue” since it performs the queuing functionalities of “storing/reading/transmitting” operation for each output), and the packet

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are changed from a per source queue (see Fig. 8, Input Shift Register, S.R.IN 61 and Fig. 9, plurality of S.R.IN for line inputs N; note that each input shift register in the shared memory is a "source queue" since it performs the queuing functionalities of "receiving/writing/storing" operation for each input.) to a corresponding per destination queue (see FIG. 15-19; see col. 10, line 49 to col. 11, line 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide input/source and output/destination registers/queues of a common cell-body memory to transfers data, as taught by Calamvokis in the system of Sindhu, so that it would provide a switch core which includes circuitry enabling the appropriate routing of cells between input and output registers/queues of a common cell-body memory; see Calamvokis col. 2, line 33-38.

Neither Sindhu nor Calamvokis explicitly disclose once all segments for a packet are received, all the segments of the packet are changed to a corresponding queue. Petersen discloses that once all segments for a packet are received, all the segments of the packet are changed to a corresponding per destination queue (see Fig. 12, FIFO-OUT 1208 and Connection table 1207; and col. 8, line 1-15; note that once all the segments (i.e. first, middle, and last segment) arrive, SAR fully reassemble the user packet and transmitted to FIFO-OUT.) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide sending/changing fixed sized cells to the FIFO once all fixed sized cells of the variable size packet are received, as taught by Petersen in the combined system of Sindhu and Calamvokis, so that it would effectively utilizes available bandwidth and avoids the problems associated with switching excessively large cells from



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one stream to another by complete segmenting and reassembling; see Petersen col. 2, line 15-46.

**Regarding claims 10 and 22**, the combined system of Sindhu, Calamvokis, and Petersen discloses all limitations described above in Claims 1-9 and 14-21. Moreover, Petersen discloses acceptance criteria for accepting segments (see Fig. 6, step 608 “threshold” and step 610 “time-out”), and if the segment is not accepted, then all previously received segments associated with the segment not accepted are purged and any segments associated with the segment not accepted that are received after the segment that was not accepted was received, are ignored (see Fig. 6, Reassembly state 602 for utilizing threshold and time-out for detecting error, and Abort State 603 for discarding the cells after detecting error; also see col. 5, line 1-40; note that during the reassembly process, the reconstruction of the user packet begins only after receiving the last segment. If the last segment is not received during a threshold period, a time-out occurs. Then the process is in the abort mode by halting reassembly process and return to idle mode. At the Idle mode, the process must begin reassembling from the first segment. Thus, all invalid segment segments receive during the abort mode are discarded since the process is now returning back to the idle mode.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Sindhu, Calamvokis, and Petersen, as taught by Petersen, for the same reason stated in Claims 9 and 21 above.

**Regarding claims 11**, the combined system of Sindhu, Calamvokis and Petersen discloses all limitations as described above in claims 1-10. Sindhu disclose a fabric (see FIG. 2B, a combined system of input switch 100, memory 104, controller 106, and output switch

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102 are a fabric of the router 100) in which the aggregator (see FIG. 2B, input switch 100) and the memory controller (see FIG. 2B, memory 104 and controller 106) are disposed, and including a separator (see FIG. 2B, output switch 102) disposed in the fabric connected to the aggregator (see col. 4, lines 20-30).

**Regarding claim 12**, Sindhu discloses a port card (see FIG. 2B, a combined system of input port 107 and output port 108) having a striper (see FIG. 3, Data Handler 304 of input port 107) which sends portions of packets to the aggregator (see FIG. 5B, fixed length cells 450 and 452 are sends to input switch 100; see col. 5, lines 55-66), and an unstriper (see FIG. 17, Output formatter 1714 of output port 108; see col. 11, lines 62 to col. 12, lines 6) which receives portions of packets from the separator (see FIG. 15, output switch 102; note that output formatter receives fixed length cells from output switch and reassemble back into a variable length packet; see col. 10 see col. 22-47; see col. 11, lines 62 to col. 12, lines 6; ).

**Regarding claim 13**, the combined system of Sindhu, Calamvokis and Petersen discloses the memory controller includes a memory as described above in claims 1-12. Sindhu discloses a shared memory (see FIG. 2B, memory 104), and the source queues (see FIG. 2B, memory banks 105) are part of the shared memory. Calamvokis discloses the memory controller includes a shared memory (see Fig. 9, Memory bank of Shared Cell-body memory 73 and N Port Line SR Block 71), and the destination queues (see Calamvokis'610 Fig. 9, S.R.OUT) and the source queues (see Calamvokis'610 Fig. 9, S.R.IN) are part of the shared memory.

**Regarding claim 23**, Sindhu discloses the step of receiving portions of packets from different sources at the aggregator of the transferring mechanism (see FIG. 5B, fixed length

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cells 450 and 452 are receives at input switch 100) disposed in the fabric of the switch from a striper (see FIG. 3, Data Handler 304 of output port 108) of a port card (see FIG. 2B, a combined system of input port 107 and output port 108) of the switch (see col. 5, lines 55-66).

**Regarding claim 24**, Sindhu discloses sending portions of packets from the memory controller (see FIG. 2B, memory 104 and controller 106) with a separator of the fabric (see FIG. 15, output switch 102) to an unstriper of the port card (see FIG. 17, Output formatter 1714 of output port 108; see col. 11, lines 62 to col. 12, lines 6).

### ***Response to Arguments***

11. Applicant's arguments with respect to claim 1,3-14, and 16-24 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 571-272-3085. The examiner can normally be reached on M-F: 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**BRIAN NGUYEN**  
**PRIMARY EXAMINER**